Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : **Natural Gas**
Uses : Gaseous fuel for domestic and non-domestic uses.

Manufacturer/Supplier : **Shell Energy North America (US), L.P.**
Two Houston Center
909 Fannin
Plaza Level 1
Houston, TX 77010
USA
MSDS Request : 713-767-5400

Emergency Telephone Number
Spill Information : 877-504-9351
Health Information : DOMESTIC NORTH AMERICA 800-424-9300
INTERNATIONAL, CALL 703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Identity	CAS No.	Concentration
Natural gas	8006-14-2	100.00 %

Contains Methane, CAS # 74-82-8
Contains Propane, CAS # 74-98-6
Contains Ethane, CAS # 74-84-0
Contains Butane, CAS # 106-97-8
Contains hydrogen sulphide, CAS # 7783-06-4.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour : Colourless. Gas. Typical gas smell due to addition of odouriser to allow the detection of product leaks..

Health Hazards : Vapours may cause drowsiness and dizziness. High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.

Safety Hazards : Extremely flammable. May form flammable/explosive vapour-air mixture. Electrostatic charges may be generated during handling. Electrostatic discharge may cause fire.

Environmental Hazards : Not classified as dangerous for the environment.

Health Hazards

Inhalation : High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen.Exposure to high gas/vapour concentrations may

lead to narcotic or anaesthetic effects that may impair judgement or lead to central nervous system depression.Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.

Signs and Symptoms : Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

Environmental Hazards : Not classified as dangerous for the environment.

4. FIRST AID MEASURES

General Information : Vaporisation of H2S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from the victim to rescuer. Mechanical ventilation should be used to resuscitate if at all possible.

Inhalation : Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin Contact : If persistent irritation occurs, obtain medical attention.

Eye Contact : If persistent irritation occurs, obtain medical attention.

Ingestion : In the unlikely event of ingestion, obtain medical attention immediately.

Advice to Physician : Treat symptomatically. Hydrogen sulphide (H2S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : -187.8 °C / -306.0 °F

Upper / lower Flammability or : >= 5 %(V)

Explosion limits		
		<= 15 %(V)
Auto ignition temperature	:	583 °C / 1,081 °F
Specific Hazards	:	Forms flammable mixture with air. If released, the resulting vapours will disperse with the prevailing wind. If a source of ignition is present where the vapour exists at 5-15% concentration in air, the vapour will burn along the flame front toward the source of the fuel.
Suitable Extinguishing Media	:	Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

Protective measures	:	Remove all possible sources of ignition in the surrounding area. Evacuate all personnel. Do not breathe fumes, vapour. Do not operate electrical equipment. Avoid contact with skin, eyes and clothing. Ventilate contaminated area thoroughly. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.
Additional Advice	:	Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

7. HANDLING AND STORAGE

General Precautions	:	Take precautionary measures against static discharges.
Handling	:	Avoid contact with skin, eyes and clothing. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 50 ppm, the area should be evacuated unless respiratory protection is in use.
Storage	:	Keep away from sources of ignition - No smoking. Keep container tightly closed and in a cool, well-ventilated place. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. These include issuing of work

permits, gas-freeing of tanks, using a manned harness and lifelines and wearing air-supplied breathing apparatus.
Prior to entry and whilst cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter.

Product Transfer : Earth all equipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Methane	ACGIH	TWA	1,000 ppm		
Ethane	ACGIH	TWA	1,000 ppm		
Propane	OSHA Z1	PEL	1,000 ppm	1,800 mg/m3	
Propane	OSHA Z1A	TWA	1,000 ppm	1,800 mg/m3	
Propane	ACGIH	TWA	1,000 ppm		
Butane	ACGIH	TWA	1,000 ppm		
Hydrogen Sulphide	ACGIH	TWA	10 ppm		
Hydrogen Sulphide	ACGIH	STEL	15 ppm		
Hydrogen Sulphide	OSHA Z1A	TWA	10 ppm	14 mg/m3	
Hydrogen Sulphide	OSHA Z1A	STEL	15 ppm	21 mg/m3	
Natural gas	ACGIH	TWA	1,000 ppm		

Exposure Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.

Personal Protective Equipment : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where respiratory protective equipment is required, use a full-face mask. All respiratory protection equipment and use must be in accordance with local regulations.
Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Hand Protection	:	Not normally required. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact. Always seek advice from glove suppliers. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns.
Eye Protection	:	Chemical splash goggles (gas-tight monogoggles) and face shield with chin guard.
Protective Clothing	:	Skin protection not ordinarily required beyond standard issue work clothes.
Monitoring Methods	:	Monitoring the oxygen content of the air is often the best means of ensuring safety. There are substantial risks if the concentration of oxygen in the atmosphere varies from the normal (20.8%) under normal atmospheric pressure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Colourless. Gas.
Odour	:	Typical gas smell due to addition of odouriser to allow the detection of product leaks..
Initial Boiling Point and Boiling Range	:	-161.5 °C / -258.7 °F
Flash point	:	-187.8 °C / -306.0 °F
Upper / lower Flammability or Explosion limits	:	>= 5 %(V) <= 15 %(V)
Auto-ignition temperature	:	583 °C / 1,081 °F
Density	:	420 g/cm3 at -165.5 °C / -265.9 °F Liquid methane at boiling point.
Water solubility	:	0.08 g/l at 25 °C / 77 °F
Vapour density (air=1)	:	Typical 0.58

10. STABILITY AND REACTIVITY

Stability	:	Stable under normal use conditions.
Conditions to Avoid	:	Heat, flames, and sparks. May form explosive mixture on contact with air.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Acute Oral Toxicity	:	LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	:	LD50 > 5000 mg/kg , Rat
Acute Inhalation Toxicity	:	LC50 >20 mg/l / 4 h, Rat Breathing of high vapour concentrations may cause central

nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.

Skin Irritation	:	Not expected to be a hazard.
Eye Irritation	:	Not expected to be a hazard.
Respiratory Irritation	:	Not expected to be a respiratory irritant.
Sensitisation	:	Not a skin sensitiser.
Mutagenicity	:	Not considered a mutagenic hazard.
Carcinogenicity	:	Components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	:	Not a developmental toxicant.
Additional Information	:	High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

12. ECOLOGICAL INFORMATION

Information given is based on product data, a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity	:	Practically non toxic: LC/EC/IC50 > 100 mg/l (to aquatic organisms)
Mobility	:	Contains volatile components. Evaporates extremely rapidly from water or soil surfaces.
Persistence/degradability	:	Inherently biodegradable. Oxidises rapidly by photo-chemical reactions in air.
Bioaccumulation	:	Does not bioaccumulate significantly.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Do not discharge into areas where there is a risk of forming an explosive mixture with air.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)

Identification number	UN 1971
Proper shipping name	Natural gas, compressed
Class / Division	2.1

IMDG

Identification number	UN 1971
Proper shipping name	NATURAL GAS, COMPRESSED
Class / Division	2.1
Marine pollutant:	No

IATA (Country variations may apply)

Identification number	UN 1971
Proper shipping name	Natural gas, compressed
Class / Division	2.1

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Comprehensive Environmental Release, Compensation & Liability Act (CERCLA)

Natural Gas ()	Reportable quantity: 100 lbs
Natural gas (8006-14-2)	Reportable quantity: 100 lbs
Methane (74-82-8)	Reportable quantity: 100 lbs
Propane (74-98-6)	Reportable quantity: 100 lbs
Ethane (74-84-0)	Reportable quantity: 100 lbs
Hydrogen Sulphide (7783-06-4)	Reportable quantity: 100 lbs

Clean Water Act (CWA) Section 311

Hydrogen Sulphide (7783-06-4)	Reportable quantity: 100 lbs

SARA Hazard Categories (311/312)
Immediate (Acute) Health Hazard. Fire Hazard. Sudden Release of Pressure Hazard.

SARA Extremely Hazardous Substances (302/304)

Hydrogen Sulphide (7783-06-4)	Reportable quantity: 100 lbs
Hydrogen Sulphide (7783-06-4)	Threshold Planning Quantity: 500 lbs

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

New Jersey Right-To-Know Chemical List

Natural gas (8006-14-2)	Listed. Listed. Listed. Listed. Listed. Listed. Listed. Listed.
Methane (74-82-8)	Listed. Listed. Listed.
Propane (74-98-6)	Listed.
Ethane (74-84-0)	Listed.
Hydrogen Sulphide (7783-06-4)	Listed.
Butane (106-97-8)	Listed.

Pennsylvania Right-To-Know Chemical List

Natural gas (8006-14-2)	Listed.
Methane (74-82-8)	Listed.
Propane (74-98-6)	Listed.
Ethane (74-84-0)	Listed.
Hydrogen Sulphide (7783-06-4)	Environmental hazard. Listed.
Butane (106-97-8)	Listed.

16. OTHER INFORMATION

MSDS Version Number : 2.0

MSDS Effective Date : 11/23/2009

Material Safety Data Sheet

MSDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
MSDS Distribution	:	The information in this document should be made available to all who may handle the product.
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.